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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/698,961 | 10/31/2003 | Sivakumar Ramasamy | 0275M-000666/COB | 8815 |
| 27572 | 7590 | 10/24/2005 | EXAMINER | |
| HARNESS, DICKEY & PIERCE, P.L.C. | | | SHARP, JEFFREY ANDREW | |
| P.O. BOX 828 | | | ART UNIT | PAPER NUMBER |
| BLOOMFIELD HILLS, MI 48303 | | | 3677 | |

DATE MAILED: 10/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|---------------------------------|--|
| Office Action Summary | Application No. 10/698,961 | Applicant(s) RAMASAMY ET AL. | |
| | Examiner Jeffrey Sharp | Art Unit 3677 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27, 29-31, 33-42 and 48-52 is/are pending in the application.
- 4a) Of the above claim(s) 19-22 and 48-52 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18, 23-27, 29-31 and 33-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

[1] This action is responsive to Applicant's remarks/amendment/request for continued examination filed on 10 October 2005 with regard to the Official Office action mailed on 10 June 2005.

Status of Claims

[2] Claims 1-27, 29-31, 33-42, and 48-52 are pending.

Claims 19-22 and 48-52 are withdrawn from consideration

Claim Objections

[3] Claim(s) 2, 13, 18, 35, 36, 40, and 41 were previously objected to because of informalities. Applicant has successfully addressed these issues in the amendment filed on 10 October 2005. Accordingly, the objection(s) to the claim(s) have been withdrawn.

However, claim 18 is currently objected to, because the word "amid" on line 6 of claim 18 should be --and-- as previously indicated in the Office Action mailed on 10 June 2005.

Appropriate action is required.

Response to Arguments/Remarks

[4] Claim 42 was previously rejected under 35 U.S.C. 102(b) as being anticipated by Bregenzer et al. GB 2,065,011 A1.

Applicant's arguments/remarks with regard to this reference have been fully considered, but are not persuasive.

Applicant has amended claim 42 in an attempt to define over the Bregenzer et al. reference. The claim now calls for "wherein the first and second metallic layers are welded together". This is already an inherent property of the composite panel taught in the Bregenzer et al. reference, as evidenced by NPL T.W. Clyne et al., "Development of a New Ultra-Light Metallic Sheet Material", January 2002, Research Proposal for Cambridge-MIT Institute. Although the Bregenzer et al. reference appears to be silent as to what happens to the laminated sheets during welding, the Clyne et al. reference expressly fills in the gaps of inherency where the Bregenzer et al. reference is silent.

(57) A stud for securing metal sheets, and composite panels with metal cover sheets, in place from one side only, in particular composite panels with a plastics core and cover sheets made of aluminium or aluminium alloys, is

Bregenzer et al. GB 2,065,011 A1.

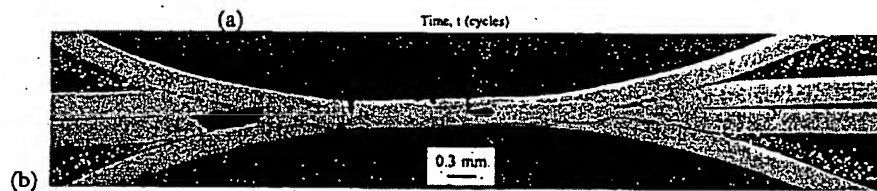


Fig.4: (a) V(t) and I(t) plots obtained during resistance welding of two HSSA sheets (cycle time = 200 ms) and (b) micrograph of a polished section through such a weld.

T.W. Clyne et al., "Development of a New Ultra-Light Metallic Sheet Material", January 2002, Research Proposal for Cambridge-MIT Institute.

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Accordingly, after further consideration of Applicant's remarks and the prior art of record, the rejection of claim 42 under 35 U.S.C. 102(b) as being anticipated by Bregenzer et al. GB 2,065,011 A1 is maintained.

[5] Claim(s) 1-12, 14-17, 23-27, 29-31, and 33-42 were previously rejected under 35 U.S.C. 103(a) as being unpatentable over Bregenzer et al. GB 2,065,011 A1 in view of Soyer DE-4,222,664 and Applicant's disclosure.

Applicant's arguments/remarks with regard to this reference have been fully considered, and are persuasive.

Accordingly this rejection has been withdrawn.

New Grounds of Rejection

Claim Rejections - 35 USC § 102

[6] The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

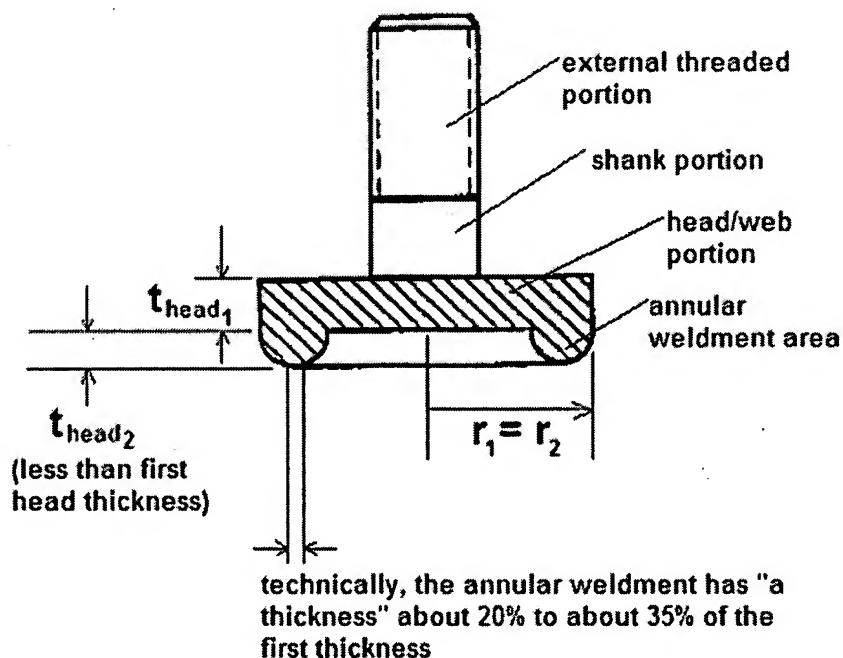
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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[7] Claims 1-3, 5, and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 1060826 A1. See annotated figure below.

In short, the EP 1060826 A1 reference teaches a weldable ring stud fastener having a solid cylindrical body having an exterior threaded portion, and a web having a first head thickness that is greater than a second annular weldment area head thickness; wherein the outer radius of the web and annular weldment area is the same. Note that Applicant does not significantly limit "annular weldment area" and/or how "thickness" is measured, and therefore the EP 1060826 A1 reference broadly reads on the abovementioned claims.

EP 1 060 826 A1

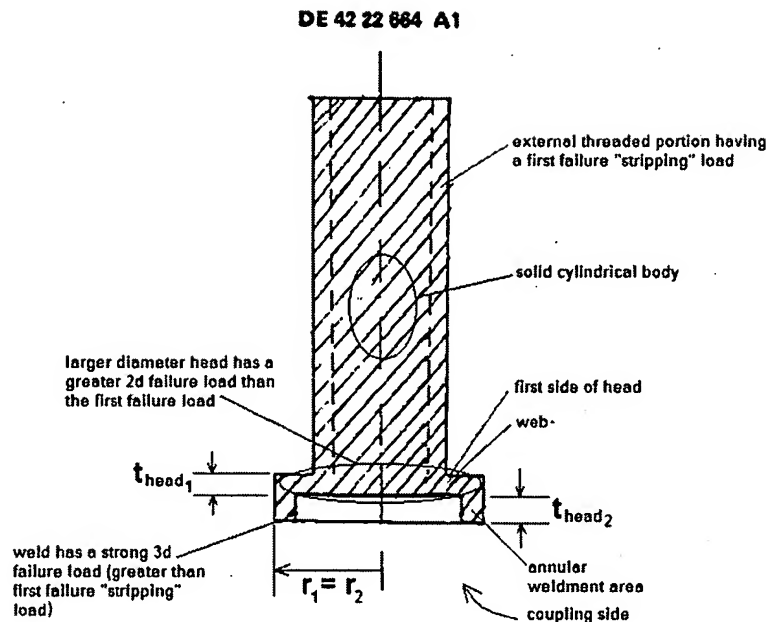
Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

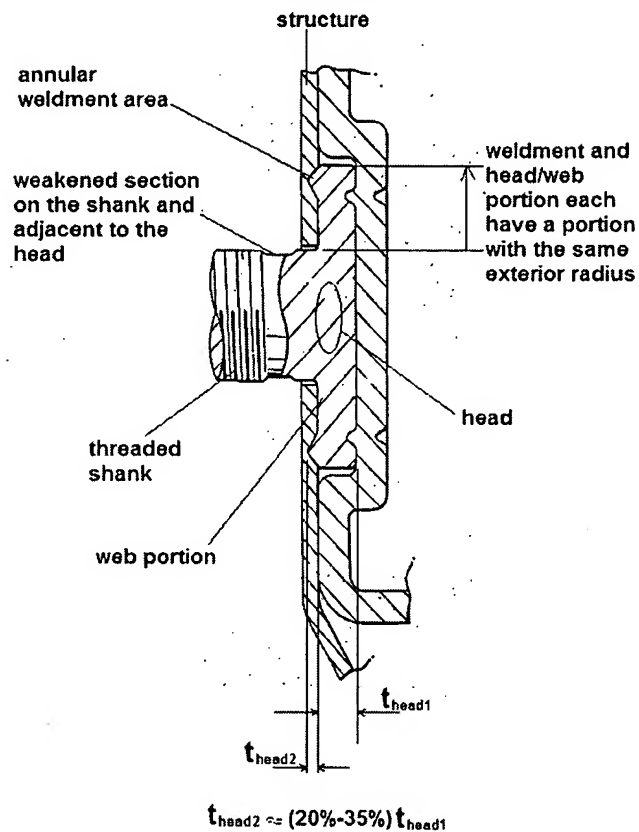
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

[8] Claims 1-12, 23-27, and 29-30, are rejected under 35 U.S.C. 103(a) as being unpatentable over Soyer DE 4,222,664 A1 in view of Arino et al. US-4,689,958.

In short, Soyer teaches a weld stud having all of the claimed limitations disclosed, except for the **claimed thickness** of the annular weldment area and a **weakened portion** at the shank adjacent the head. It would be readily apparent that the external threads would fail (e.g., "strip") at a first failure load much less than the head/web portion would be sheared (at a second failure load). Further, the shank has a smaller cross-sectional area making it more prone to shearing than the larger head/web portion.



Arino et al. suggest a weld stud having many of the claimed limitations, but mainly suggests an annular weldment area having a thickness in the axial direction of approximately less than 50%, and even more specifically, about 20%-35% of the thickness of the head/web portion in the axial direction. See the annotated figure below. It is important that Arino et al. depict an annular weldment portion having such a thickness, because the weld stud is to be used with a structure (1) of decreased thickness (in order to reduce the weight of the part 3). In essence, Arino et al. make obvious, decreasing the thickness of an annular weldment area to the claimed relative size dimensions (e.g., 20%-35% of the head/web thickness), in order to perform successfully with thin sheet panel structures. The Arino et al. reference further suggests a weakened section on the shank positioned adjacent the head for a smooth thread clearance and transition.

U.S. Patent 4,689,958

At the time of invention, it would have been obvious to modify the thickness of the annular weldment taught by Soyer, as shown by Arino et al., so as to provide Soyer's device with the capability of being welded to thinner substrates without damage.

[9] Claims 14-18, 31, and 33-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soyer DE 4,222,664 A1 in view of Arino et al. US-4,689,958 and Bregenzer et al. GB 2,065,011 A1.

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Soyer and Arino et al. fairly suggest the limitations found in claims 1-12, 23-27, and 29-30 as discussed above, however, these references alone, are silent as to the use of the stud with a laminate panel comprising two metallic sheets "sandwiching" a polymer core.

The Bregenzer et al. reference generally makes obvious using welding studs with laminate panels having first and second metallic layers "sandwiching" a polymer core. It is well-known to those of ordinary skill in the art that these metallic layers fuse together when welding takes place, and that at least a portion of the weldment area will be disposed within the panel after a welding process.

(57) A stud for securing metal sheets, and composite panels with metal cover sheets, in place from one side only, in particular composite panels with a plastics core and cover sheets made of aluminium or aluminium alloys, is

Bregenzer et al. GB 2,065,011 A1.

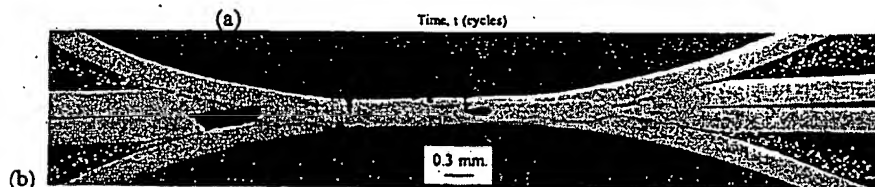


Fig.4: (a) V(t) and I(t) plots obtained during resistance welding of two HSSA sheets (cycle time = 200 ms) and (b) micrograph of a polished section through such a weld.

T.W. Clyne et al., "Development of a New Ultra-Light Metallic Sheet Material", January 2002, Research Proposal for Cambridge-MIT Institute.

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[10] Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Soyer DE 4,222,664 A1 in view of Arino et al. US-4,689,958 and in even further view of Bidefeld US-5,054,980.

Soyer and Arino et al. fairly suggest the limitations found in claim 12 as discussed above, however, these references alone, are silent as to a nut attached thereto having a fourth failure load less than the third failure load of the weldment area.

It would be obvious to attach a nut or other internally (female) threaded device to an externally (male) threaded weld stud as evidenced by Bidefeld US-5,054,980. Otherwise, there would be no apparent reason to provide such an external thread to the stud. In a sense, the threads of both the nut and stud would fail at first and fourth failure loads greater than the third failure load of the welding area, because a threaded connection would "strip" long before a strong weld is broken. Note that even Bidefeld suggests a weakened section on the shank and adjacent the head to provide a thread clearance and smooth transition between the shank and head. What Bidefeld does not suggest is an external annular groove in the periphery of said nut in order to provide said fourth failure load (not claimed by Applicant).

[11] Claims 6, 7, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1060826 A1.

As for claims 6, and 7, merely changing the head thickness to be greater than 2.0 mm is not a patentable improvement over the prior art of record, as it has been held that a change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955). Furthermore, one of ordinary skill in the art would appreciate that

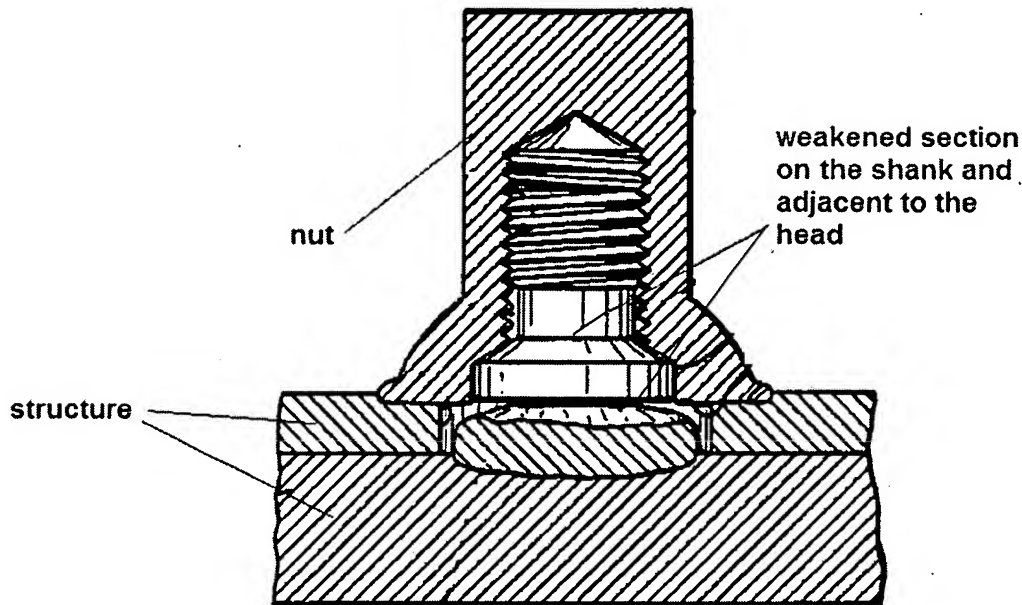
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weld studs and other fasteners generally come in various sizes to suit different applications. In the instant case, Applicant's alleged improvement over the prior art is the relative thickness of an annular weldment area with respect to a web or head portion. EP 1060826 A1 clearly teaches this limitation (i.e., a second head thickness of the annular weldment area to be "less than 50% the first head thickness"). Stating a specific preferable dimension of a prior art device would be within the ordinary skill of a worker.

As discussed above, although the EP 1060826 A1 reference is silent as to the respective failure loads of claims 11 and 12, it would be readily apparent to those skilled in the art, that the external threads would fail (e.g., "strip") at a first failure load much less than the head/web portion would be sheared (at a second failure load). Further, the shank has a smaller cross-sectional area making it more prone to shearing and failure than the larger and wider head/web portion. Similarly, those of ordinary skill in the art would recognize that the weld portion would stay intact under much higher loads (third failure load) than the torque required for stripping the threads of the shank (first failure load).

[12] Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1060826 A1 in view of Bidefeld US-5,054,980.

The EP 1060826 A1 reference fails to suggest using the weld stud in combination with a nut and does not disclose expressly, a weakened section on the shank adjacent the head.

U.S. Patent 5,054,980

Bidefeld suggests using a nut with a weld stud in order to secure a structure to the structure the weld stud is attached to. It would be apparent to those of ordinary skill in the art, that the shank and nut have a mating threaded portion that would strip at a lower first/fourth failure load, before the weld portion's third failure load. Note that Bidefeld further teaches a weakened portion on the shank adjacent to the head that could be used as a thread clearance, to prevent weld splash to the threads, or to lighten the weight of the fastener as an intended use.

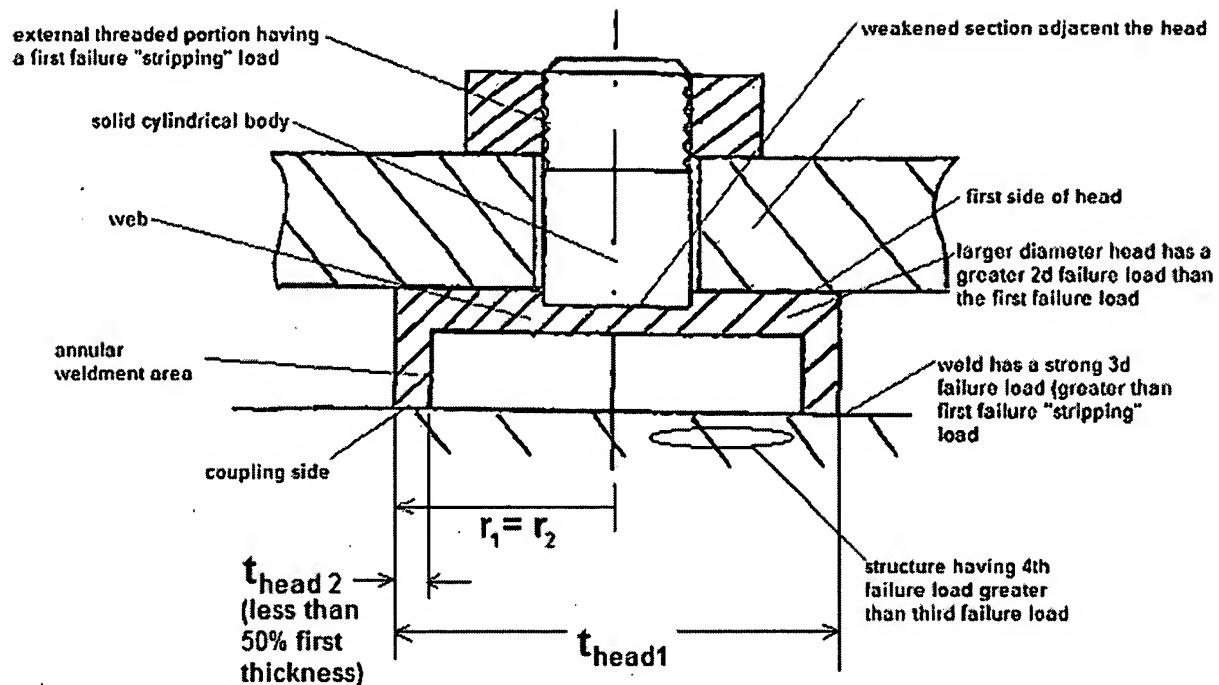
At the time of invention, it would have been obvious to one having an ordinary skill in the art to employ a nut having a fourth failure load less than the third failure load of the weldment, so as to aid in securing a structure to the structure to which the weld stud is permanently attached. It would have further been obvious to employ a weakened section adjacent the head, so as to provide a clearance for the threads, make the fastener lighter by removing unnecessary material, or in order to serve as a thread safeguard from weld splash.

[13] Claims 14-18, 31, and 33-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1060826 A1 in view of Bregenzer et al. GB 2,065,011 A1.

Although the EP 1060826 A1 reference appears to be silent about an intended use with a composite panel, the Bregenzer et al. GB 2,065,011 A1 makes clearly obvious, the fact that such a weld stud could be advantageously used with a laminate panel comprising first and second metallic layers that "sandwich" a polymer core layer. See, also, NPL T.W. Clyne et al., "Development of a New Ultra-Light Metallic Sheet Material", January 2002, Research Proposal for Cambridge-MIT Institute (Figure 4), which makes obvious the first and second metallic layers being welded together when such a composite panel is subjected to a welding process.

[14] Claims 1-4, 6-18, 23, 25, 26, 27, 29-31, and 33-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 03/004883 in view of Bregenzer et al. GB 2,065,011 A1. See annotated drawing below.

In short, the WO 03/004883 reference suggests a weld stud and stud to structure combination comprising every structural element contained in the abovementioned claims, and suggests the relative size dimension limitations "wherein the second head thickness being less than 50% of the first head thickness". Although it appears the reference is silent about relative failure loads, it would be apparent to those ordinary skilled, that these are limitations inherent to the WO 03/004883 disclosure.



The device taught by WO 03/004883 is to be used in automotive applications, but the reference appears silent as to the welding stud being attached to a laminate panel.

Laminate sheets such as Hylite® are well-known in the automotive industry as advantageous equivalents to conventional sheet metal panels, because they are lighter in weight, provide better insulation, and possess improved sound and vibration damping characteristics. Bregenzer et al. suggest that weld studs can be attached to these panels as an intended use.

At the time of invention, it would have been obvious to one having an ordinary skill in the art, to attach the weldable stud taught by WO 03/004883 to a laminate panel as suggested by Bregenzer et al. as an intended use of the stud, because laminate panels are lighter in weight, provide better insulation, and possess improved sound and vibration damping characteristics.

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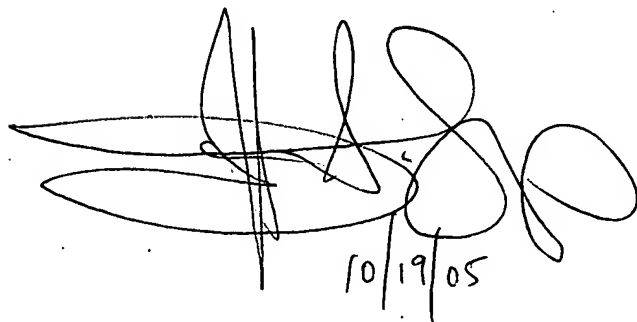
Conclusion

[15] Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey Sharp whose telephone number is (571) 272-7074. The examiner can normally be reached 7:00 am - 5:30 pm Mon-Thurs.

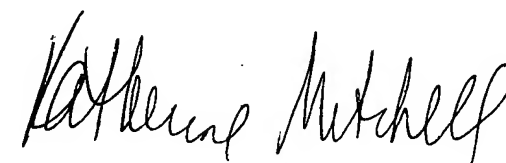
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, J.J. Swann can be reached on (571) 272-7075. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JAS



10/19/05



Katherine Mitchell
Primary Examiner